Authors' objectives
The author states that the objective was to ascertain if pelvic floor muscle exercises (PFMEs) have merit as a conservative treatment for erectile dysfunction (ED). However, the author also reviews studies investigating the role of biofeedback, electrical stimulation, acupuncture, electro-acupuncture and hypnosis, visual erotic stimulation, artificial saline erection, and maximal ischiocavernosus muscle (ICM) contractions, in addition to a study which merely recorded intracavernosal pressure and ICM activity with nocturnal erections. Therefore, the author appears to have studied a range of physical therapy interventions to ascertain their merit as conservative treatments for ED.

Searching
MEDLINE, AMED, CINAHL, EMBASE: Rehabilitation and Physical Medicine, and the Cochrane Library were searched from 1980 to 1999 using the following keywords: 'erectile dysfunction' (ED), 'impotence', 'conservative treatment', 'physical therapy', 'physiotherapy', 'pelvic floor exercises', 'biofeedback', 'electrical stimulation', 'electrotherapy' and 'acupuncture'. A manual search was undertaken of manuscripts found from the references of this literature.

Study selection

Study designs of evaluations included in the review
The included studies were clinical trials. Only four trials used a control group, and only two trials used randomisation procedures.

Specific interventions included in the review
Treatments including physical therapy interventions were eligible for inclusion. Eight trials used PFMEs, of which two included biofeedback, one added electrical stimulation and four included biofeedback and electrical stimulation. Two further studies used electrical stimulation only for ED, one used acupuncture, and another used electro-acupuncture and hypnosis. One of the two remaining studies used artificial saline erection and maximal ICM contractions; the other merely recorded intracavernosal pressure and ICM activity with nocturnal erections. Details of the control or comparison groups were provided in tabular format and in the text of the review.

Participants included in the review
Men with ED. Where age was reported, the participants' age ranged from 18 to 76 years. Some participants had ED with venous leakage, some had psychogenic ED, some had ED with no organic cause, and some were vasoactive nonresponders.

Outcomes assessed in the review
Studies using outcome measures that were clinically relevant and reliable for the problem under investigation were eligible for inclusion. Nine studies used subjective outcomes, two used subjective outcomes with the partners’ verification, and three used objective outcomes as measured by the author.

How were decisions on the relevance of primary studies made?
The author does not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
The methodological quality of the trials was assessed using criteria based on generally accepted principles of interventional research. These included the study design, methods, amount of treatment, and the time of assessment. The author does not state how the papers were assessed for quality, or how many of the reviewers performed the quality assessment.
**Data extraction**
The author does not state how the data were extracted for the review, or how many of the reviewers performed the data extraction.

**Methods of synthesis**
How were the studies combined?
A qualitative narrative synthesis was undertaken. The studies were not weighted and publication bias was not assessed.

How were differences between studies investigated?
Heterogeneity was not statistically assessed.

**Results of the review**
Fourteen studies were included in the review. One study was a randomised controlled trial, three studies were controlled but non-randomised, whilst another was not controlled but the patients were randomised to receive surgery or PFMEs; the remainder of the studies were non-randomised and non-controlled. The total number of participants was 1,342.

Eight studies using PFMEs showed that maximal pelvic floor muscle work can aid penile rigidity and cure or improve ED.

Five trials used PFMEs with biofeedback in order to provide patient awareness and stimulate increased effort. Of these, two included biofeedback as the only other modality and three combined PFMEs with biofeedback and electrical stimulation. It was impossible to determine which modality caused the effect when three modalities were used.

When electrical stimulation was combined with PFMEs, it was impossible to know which modality produced the effect. However, two trials applying electrical stimulation alone to the ICM and to the smooth muscle of the penile corpus cavernosum found cure rates of 10.4 and 23%, respectively. Both of these cure rates were low compared with the PFME trials.

Acupuncture may have a place in the treatment of ED but the evidence was poor.

**Authors' conclusions**
PFMEs using ICMs and bulbocavernous muscles (BCMs) seem to have apparent merit as a treatment for ED due to mild or moderate venous leakage, and appear to be a realistic alternative to surgery. Men suffering from ED due to other causes may also benefit. Patients also suffering from urinary incontinence and postmicturition dribble could combine a simultaneous training programme of PFMEs. There was no strong evidence to suggest that electrical stimulation or electro-acupuncture was either effective or ineffective. No studies demonstrating preventive conservative treatment were found.

**CRD commentary**
The author stated the review question and inclusion criteria clearly. However, the objective was to ascertain whether PFMEs have merit as a conservative treatment for ED, whilst the selection criteria specified that the treatment under investigation included physical therapy interventions, not just PFMEs.

The literature search was clearly described and thorough, although no attempt was made to identify grey literature. It was not stated whether any language restrictions were applied. Publication bias was not assessed.

The author did not provide any details relating to how the studies were selected or the data were extracted, e.g. how many of the reviewers were involved, whether the studies were examined independently, whether the reviewers were blinded to source, and how any disagreements were resolved. Details of the studies were reported adequately in tabular
format and in the text. Heterogeneity between the studies was not evaluated.

The author's conclusions are an appropriate summary of the results of this reasonably well-conducted systematic review; they appear to be relevant to the subject area.

**Implications of the review for practice and research**

**Practice:** The author states that PFMEs appear to have considerable merit as a treatment for ED in patients with venous leakage. They may also be useful for ED from other causes such as poor musculature, or from a psychogenic origin. PFMEs are noninvasive, easy to perform, painless, cost-effective and free from drug side-effects. PFMEs should be targeted at the ICMs and BCMs. It was impossible to tell from the literature if biofeedback enhanced exercise performance or improved the effect of PFMEs. It seems reasonable to suppose that electromyography at the ICMs could be used to monitor the muscles concerned with penile erection and intracavernosal pressure increases, rather than biofeedback with a rectal pressure probe. In addition, instead of using invasive needle electromyography, muscle activity of the ICM and the BCM may be monitored by small surface electromyography sensors. Patients performing PFMEs for urinary incontinence, which can occur postprostatectomy, and for postmicturition dribble could combine a simultaneous training programme of PFMEs for ED.

**Research:** The author states that randomised controlled trials with larger sample numbers are needed to explore the use of pelvic floor exercises as a first-line treatment for men with ED. Similar trials are also needed to ascertain the role of pelvic floor exercises as a prevention for ED. Other suggestions for further research are also made in the paper.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.